

MOBILE TERMINAL AND DATA TRANSMISSION SYSTEM

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Inventor: Y NEMOTO YOSHIFUMI (JP); WADA HIROMI (JP);
HIROSE TAKAKO (JP); KATO ATSUNOBU (JP);
NAKATSUCHI MASAHARU (JP); CHIBA KOJI (JP)

Applicant: MATSUSHITA ELECTRIC IND CO LTD (JP);
MATSUSHITA COMM IND CO LTD (JP); NIPPON
TELEGRAPH & TELEPHONE (JP)

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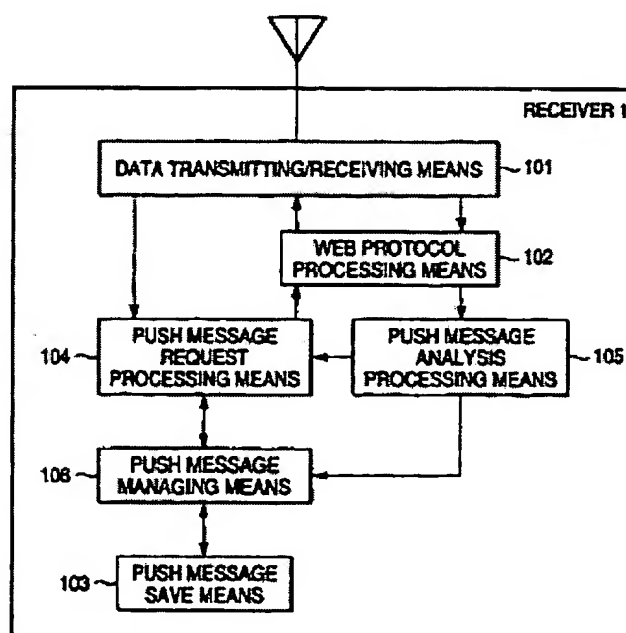
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Abstract of EP1061701

There is provided a mobile terminal such as a portable telephone set equipped with relatively small data memory and a data transmission scheme adapted to receive PUSH messages provided by the information source at an arbitrary timing without fail. The message request processing means (104), based on the description on messages contained in the incoming notice received by the data transmitting/receiving means (101), checks whether available memory is present or not in the message save means (103), and in case it is present, makes a message acquisition request to the Web protocol processing means (102). The message analysis processing means (105) analyzes messages returned from the server unit. The message managing means (106) saves the analyzed messages in the message save means (103). When an inquiry is made about whether the message memory is available or not, the message managing means (106) checks for available memory in the message save means (103) and notifies the result of the check for available memory to the message request processing means (104).

FIG. 1



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(71) Applicants:

- Matsushita Electric Industrial Co., Ltd.
Kadoma-shi, Osaka 571-0050 (JP)
- Matsushita Communication Industrial Co., Ltd.
Yokohama-shi, Kanagawa 223-0052 (JP)
- NTT Mobile Communications Network Inc.
Minato-ku, Tokyo 105-0001 (JP)

(72) Inventors:

- YOnemoto, Yoshifumi
Yokohama-shi Kanagawa 233-0007 (JP)

• Wada, Hiromi

Neyagawa-shi, Osaka 572-0841 (JP)

• Hirose, Takako

Hirakata-shi, Osaka 573-0171 (JP)

• Kato, Atsunobu

Ebina-shi, Kanagawa 243-0411 (JP)

• Nakatsuchi, Masaharu

Yokohama-shi, Kanagawa 221-0861 (JP)

• Chiba, Koji

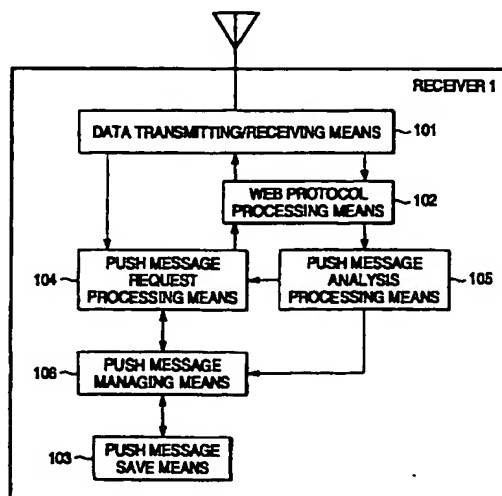
Yokohama-shi, Kanagawa 236-0032 (JP)

(74) Representative:

Grünecker, Kinkeldey,
Stockmair & Schwanhäusser
Anwaltssozietät
Maximilianstrasse 58
80538 München (DE)

(54) MOBILE TERMINAL AND DATA TRANSMISSION SYSTEM

(57) There is provided a mobile terminal such as a portable telephone set equipped with relatively small data memory and a data transmission scheme adapted to receive PUSH messages provided by the information source at an arbitrary timing without fail. The message request processing means (104), based on the description on messages contained in the incoming notice received by the data transmitting/receiving means (101), checks whether available memory is present or not in the message save means (103), and in case it is present, makes a message acquisition request to the Web protocol processing means (102). The message analysis processing means (105) analyzes messages returned from the server unit. The message managing means (106) saves the analyzed messages in the message save means (103). When an inquiry is made about whether the message memory is available or not, the message managing means (106) checks for available memory in the message save means (103) and notifies the result of the check for available memory to the message request processing means (104).

FIG. 1

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Description

Technical Field

[0001] The present invention relates to a mobile terminal and a data transmission scheme, and more particularly, to a mobile terminal and a data transmission scheme adapted to allow PUSH messages to be delivered from a server to a client (the mobile terminal) equipped with small data memory.

Background Art

[0002] In information communications in the advanced information-oriented society today, users can acquire a variety of information on demand by specifying the destination address on the Internet.

[0003] As a data transfer protocol between a server and a client, the HTTP (Hypertext Transfer Protocol) is in widespread use.

[0004] By using the HTTP, the server responds to the client's request for information and notifies the user of the target information, allowing the user to acquire such information.

[0005] In recent years, not only PULL services where a client activates a request but also PUSH services where the information source provides the client with information at an arbitrary timing.

[0006] This allows information to be provided to users from a predetermined information source without the client having to activate the information sending request.

[0007] For example, in the "A data broadcast system and a terminal thereof" disclosed in JP-A-9-148994, a variety of digital signals are transmitted via broadcast data channels and a receiver to receive broadcast data can acquire information in real time.

[0008] However, for a mobile terminal whose data memory is relatively small, a problem occurs that the mobile terminal cannot save all the information provided from the information source. This loss in information is a problem in the case of important information such as paid service information and mails.

[0009] In view of the foregoing problem, the invention aims at providing a mobile terminal equipped with small data memory and a data transmission scheme which can receive real-time information provided by an information source without fail.

Disclosure of the Invention

[0010] In order to solve the problem, a mobile terminal according to the invention is a mobile terminal which receives an incoming notice, characterized in that the mobile terminal, triggered by signals contained in the incoming notice showing the presence of a delivery message in a server, makes a request for acquiring the delivery message, and receives the delivery message

transmitted from the server based on the delivery message acquisition request.

[0011] In order to solve the problem, a mobile terminal according to the invention is characterized in that the incoming notice contains a delivery message type showing the major classification of the delivery message, and that the mobile terminal makes a delivery message acquisition request to the server based on the delivery message type.

[0012] Further, in order to solve the problem, a mobile terminal according to the invention is characterized in that the mobile terminal checks whether the mobile terminal can reserve a delivery message save area or not before making the delivery message acquisition request based on the incoming notice, and that, in case the delivery message save area can be reserved, the mobile terminal makes the delivery message acquisition request.

[0013] Further, in order to solve the problem, a mobile terminal according to the invention is characterized in that the mobile terminal determines that, in case delivery messages saved in the mobile terminal have been read and are not protected, they can be overwritten by a new incoming delivery message and determines that the save area can be reserved in a decision whether the delivery message save area can be reserved or not.

[0014] Further, in order to solve the problem, a mobile terminal according to the invention is characterized in that the delivery message type may be a mail.

[0015] Further, in order to solve the problem, a data transmission scheme according to the invention whereby a mobile terminal and a server unit performs data transmission via a network is characterized in that, when the mobile terminal returns a response indicating that the mobile terminal has received delivery messages transmitted from the server, the server deletes the stored messages.

Brief Description of the Drawings

[0016]

Fig. 1 shows the configuration of a receiver according to the embodiment of the invention.

Fig. 2 is a first flowchart showing the flow of PUSH message acquisition processing by the receiver according to the embodiment of the invention.

Fig. 3 is a second flowchart showing the flow of PUSH message acquisition processing by the receiver according to the embodiment of the invention.

Fig. 4 is a third flowchart showing the flow of PUSH message acquisition processing by the receiver according to the embodiment of the invention.

Fig. 5 shows an example of a PUSH message incoming notice according to the embodiment of the invention.

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Fig. 6 shows an example of a PUSH message acquisition request message according to the embodiment of the invention.

Fig. 7 shows an example of a first PUSH message acquired by a receiving terminal according to the embodiment of the invention.

Fig. 8 shows an example of a second PUSH message acquired by a receiving terminal according to the embodiment of the invention.

Fig. 9 is a sequence diagram showing the processing made between a receiving terminal and a server unit during data transmission made by the mobile terminal and the server via a network.

Best Mode for Carrying Out the Invention

[0017] The embodiment of the invention will be detailed below with reference to attached drawings.

[0018] Fig. 1 shows the configuration of a mobile terminal (receiver) according to the embodiment of the invention.

[0019] In Fig. 1, a receiver 1 as a mobile terminal is composed of a data transmitting/receiving means 101 for performing data transmission/reception in a portable telephone network, a Web protocol processing means 102 for processing the HTTP which is a Web protocol used to acquire contents messages stored in a server unit between the receiver and the server unit, a PUSH message save means 103 for saving PUSH messages received by the receiver 1, a PUSH message request processing means 104, a PUSH message analysis processing means 105, and a PUSH message managing means 106.

[0020] The PUSH message request processing means 104, based on the description on PUSH messages contained in the incoming notice received by the data transmitting/receiving means 101, checks whether available area is present or not in the PUSH message save means 103, and in case it is present, the PUSH message request processing means 104 makes a PUSH message acquisition request to the Web protocol processing means 102.

[0021] The PUSH message analysis processing means 105, in response to the PUSH message acquisition request made to the information source server by the PUSH message request processing means 104, performs analysis processing of PUSH messages returned from the server.

[0022] The PUSH message managing means 106 saves PUSH messages analyzed by the PUSH message analysis processing means 105 in the PUSH message save means 103. The PUSH message managing means 106, on receiving an inquiry from the PUSH message request processing means 104 about whether available area is present or not in the PUSH message save means 103 and notifies the PUSH message request processing means 104 of

the presence or absence of available area.

[0023] Figs. 2 through 4 are flowcharts showing the flow of PUSH message acquisition processing by the receiver according to the embodiment of the invention. The following describes the flow of PUSH message acquisition processing after the data transmitting/receiving means 101 of the receiver 1 in Fig. 1 has received a PUSH message incoming notice:

[0024] Step 101 : The PUSH message request processing means 104 checks the PUSH message type information contained in the PUSH message incoming notice transmitted from the data transmitting/receiving means 101. In case the PUSH message type information contains mails, execution proceeds to step 102. Otherwise, execution proceeds to step 201 in Fig. 3.

[0025] Step 102 : The PUSH message request processing means 104 makes an inquiry about presence or absence of the available mail memory to the PUSH message managing means 106. The PUSH message managing means 106 checks for available mail memory in the PUSH message save means 103, and notifies the result of the check for available mail memory. In case available area is present in the mail memory, execution proceeds to step 103. Otherwise, execution proceeds to step 201 in Fig. 3.

[0026] Step 103 : The PUSH message request processing means 104 makes an mail acquisition request to the Web protocol processing means 102. The Web protocol processing means 102, based on a request from the PUSH message request processing means 104, creates mail acquisition request data in HTTP format negotiated with the server, then asks the data transmitting/receiving means 101 to send the data. The data transmitting/receiving means 101 sends the data asked by the Web protocol processing means 102 to the server unit, and execution proceeds to step 104.

[0027] Step 104 : The data transmitting/receiving means 101, on receiving the data from the server, notifies the received data to the Web protocol processing means 102. The Web protocol processing means 102, on receiving the PUSH messages transmitted from the server unit in accordance with the HTTP format, notifies completion of receiving the PUSH messages to the PUSH message analysis processing means 105. In case the PUSH message analysis processing means 105, based on the PUSH message receiving completion notice from the Web protocol processing means 102, has successfully acquired the mails, execution proceeds to step 105. Otherwise, execution proceeds to step 201 in Fig. 3.

[0028] Step 105 : The PUSH message managing means 106, based on the request from the PUSH message analysis processing means 105, saves the received mails in the mail memory in the PUSH message save means 103. Execution then proceeds to step 106.

[0029] Step 106 : The PUSH message analysis processing means 105, based on the information about

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presence or absence of non-acquired mails contained in the received PUSH messages in the server. In case non-acquired mails are present in the server, execution proceeds to step 102. Otherwise, execution proceeds to step 201 in Fig. 3.

[0030] Hereinafter, processing for acquiring PUSH messages in accordance with the flowchart in Fig. 3 will be described.

[0031] Step 201 : The PUSH message request processing means 104 checks the PUSH message type information contained in the PUSH message incoming notice transmitted from the data transmitting/receiving means 101. In case the PUSH message type information contains the first information service message, execution proceeds to step 202. Otherwise, execution proceeds to step 301 in Fig. 4.

[0032] Step 202 : The PUSH message request processing means 104 makes an inquiry about presence or absence of the available area in the memory for the first information service message to the PUSH message managing means 106. The PUSH message managing means 106 checks for available area in the memory of the PUSH message save means 103 for the first information service message, and notifies the result of the check for available memory. In case available memory is present in the memory for the first information service message, execution proceeds to step 203. Otherwise, execution proceeds to step 301 in Fig. 4.

[0033] Step 203 : The PUSH message request processing means 104 makes a first information service message acquisition request to the Web protocol processing means 102, based on a request from the PUSH message request processing means 104, creates the first information service message acquisition request data in HTTP format negotiated with the server, then asks the data transmitting/receiving means 101 to send the data. The data transmitting/receiving means 101 sends the data asked by the Web protocol processing means 102 to the server unit, and execution proceeds to step 204.

[0034] Step 204 : The data transmitting/receiving means 101, on receiving the data from the server, notifies the received data to the Web protocol processing means 102. The Web protocol processing means 102, on receiving the PUSH messages transmitted from the server in accordance with the HTTP format, notifies completion of receiving the PUSH messages to the PUSH message analysis processing means 105. In case the PUSH message analysis processing means 105, based on the PUSH message receiving completion notice from the Web protocol processing means 102, has successfully acquired the first information service message, execution proceeds to step 205. Otherwise, execution proceeds to step 301 in Fig. 4.

[0035] Step 205 : The PUSH message managing means 106, based on the request from the PUSH message analysis processing means 105, saves the received first information service message in the mem-

ory for the first information service message in the PUSH message save means 103. Execution then proceeds to step 206.

[0036] Step 206 : The PUSH message analysis processing means 105, based on the contents type information contained in the received PUSH message, checks whether the text of the received PUSH message is written in the HTML (Hypertext Markup Language). In case the text of the received PUSH message is written in the HTML, execution proceeds to step 207. Otherwise, execution proceeds to step 210.

[0037] Step 207 : The PUSH message analysis processing means 105 checks whether in-line image information is detected indicating that image data is inserted in the HTML contents and whether a request for acquiring the image data indicated in the in-line image information has not been made. In case such a request has not been made, execution proceeds to step 208. Otherwise, execution proceeds to step 210.

[0038] Step 208 : The PUSH message analysis processing means 105 notifies the PUSH message request processing means 104 that the HTML contents received from the server unit contains non-acquired image data. The PUSH message request processing means 104 makes a non-acquired image data acquisition request to the Web protocol processing means 102. The Web protocol processing means 102, based on a request from the PUSH message request processing means 104, creates the acquisition request data in HTTP format negotiated with the server, then asks the data transmitting/receiving means 101 to send the data. The data transmitting/receiving means 101 sends the data asked by the Web protocol processing means 102 to the server unit, and execution proceeds to step 209.

[0039] Step 209 : The data transmitting/receiving means 101, on receiving the data from the server unit, notifies the received data to the Web protocol processing means 102. The Web protocol processing means 102, on receiving the PUSH messages transmitted from the server in accordance with the HTTP format, notifies completion of receiving the PUSH messages to the PUSH message analysis processing means 105. In case the PUSH message analysis processing means 105, based on the PUSH message receiving completion notice from the Web protocol processing means 102, has successfully acquired the in-line image information, the PUSH message analysis processing means 105 saves the image data information. Execution then proceeds to step 207. Otherwise, the PUSH message analysis processing means 105 skips saving the image data information. Execution then proceeds to step 207.

[0040] Step 210 The PUSH message analysis processing means 105, based on the information about presence or absence of non-acquired first information service message contained in the received PUSH messages in the server. In case non-acquired first information service message is present in the server, execution proceeds to step 202. Otherwise, execution proceeds to

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step 301 in Fig. 4.

[0041] Hereinafter, processing for acquiring PUSH messages in accordance with the flowchart in Fig. 4 will be described.

[0042] Step 301 : The PUSH message request processing means 104 checks the PUSH message type information contained in the PUSH message incoming notice transmitted from the data transmitting/receiving means 101. In case the PUSH message type information contains the second information service message, execution proceeds to step 302. Otherwise, execution terminates.

[0043] Step 302 The PUSH message request processing means 104 makes an inquiry about presence or absence of the available area in the memory for the second information service message to the PUSH message managing means 106. The PUSH message managing means 106 checks for available area in the memory of the PUSH message save means 103 for the second information service message, and notifies the result of the check for available memory. In case available memory is present in the memory for the second information service message, execution proceeds to step 303. Otherwise, execution terminates.

[0044] Step 303 : The PUSH message request processing means 104 makes a second information service message acquisition request to the Web protocol processing means 102. The Web protocol processing means 102, based on a request from the PUSH message request processing means 104, creates the second information service message acquisition request data in HTTP format negotiated with the server, then asks the data transmitting/receiving means 101 to send the data. The data transmitting/receiving means 101 sends the data asked by the Web protocol processing means 102 to the server unit, and execution proceeds to step 304.

[0045] Step 304 : The data transmitting/receiving means 101, on receiving the data from the server unit, notifies the received data to the Web protocol processing means 102. The Web protocol processing means 102, on receiving the PUSH messages transmitted from the server in accordance with the HTTP format, notifies completion of receiving the PUSH messages to the PUSH message analysis processing means 105. In case the PUSH message analysis processing means 105, based on the PUSH message receiving completion notice from the Web protocol processing means 102, has successfully acquired the second information service message, execution proceeds to step 305. Otherwise, execution terminates.

[0046] Step 305 : The PUSH message managing means 106, based on the request from the PUSH message analysis processing means 105, saves the received second information service message in the memory in the PUSH message save means 103 for the second information service message. Execution then proceeds to step 306.

[0047] Step 306 : The PUSH message analysis processing means 105, based on the contents type information contained in the received PUSH message, checks whether the text of the received PUSH message is written in the HTML (Hypertext Markup Language). In case the text of the received PUSH message is written in the HTML, execution proceeds to step 307. Otherwise, execution proceeds to step 310.

[0048] Step 307 : The PUSH message analysis processing means 105 checks whether in-line image information is detected indicating that image data is inserted in the HTML contents and whether a request for acquiring the image data indicated in the in-line image information has not been made. In case such a request has not been made, execution proceeds to step 308. Otherwise, execution proceeds to step 310.

[0049] Step 308 : The PUSH message analysis processing means 105 notifies the PUSH message request processing means 104 that the HTML contents received from the server unit contains non-acquired image data. The PUSH message request processing means 104 makes a non-acquired image data acquisition request to the Web protocol processing means 102. The Web protocol processing means 102, based on a request from the PUSH message request processing means 104, creates the acquisition request data in HTTP format negotiated with the server, then asks the data transmitting/receiving means 101 to send the data. The data transmitting/receiving means 101 sends the data asked by the Web protocol processing means 102 to the server unit, and execution proceeds to step 309.

[0050] Step 309 : The data transmitting/receiving means 101, on receiving the data from the server unit, notifies the received data to the Web protocol processing means 102. The Web protocol processing means 102, on receiving the PUSH messages transmitted from the server in accordance with the HTTP format, notifies completion of receiving the PUSH messages to the PUSH message analysis processing means 105. In case the PUSH message analysis processing means 105, based on the PUSH message receiving completion notice from the Web protocol processing means 102, has successfully acquired the in-line image information, the PUSH message analysis processing means 105 saves the image data information. Execution then proceeds to step 307. Otherwise, the PUSH message analysis processing means 105 skips saving the image data information. Execution then proceeds to step 307.

[0051] Step 310 : The PUSH message analysis processing means 105, based on the information about presence or absence of non-acquired second information service message contained in the received PUSH messages in the server, checks for non-acquired second information service messages contained in the received PUSH message in the server. In case non-acquired second information service messages are present in the server, execution proceeds to step 302. Otherwise, execution terminates.

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[0052] A particular operation of the receiver 1 which operates as mentioned earlier assumed when the receiver has received the PUSH message incoming notice in Fig. 5 will be described below.

[0053] Fig. 5 shows an example of information on a PUSH message contained in the PUSH message incoming notice according to the embodiment of the invention.

[0054] The PUSH message notice incoming notice is composed of PUSH message type information indicating the classification of PUSH messages, and server storage capacity information indicating whether PUSH message storage area is full or not in the server unit.

[0055] Types of PUSH messages in this embodiment comprise mail, first information service message, and second information service message. "1" indicates that non-acquired PUSH message is present in the server. "0" indicates that non-acquired PUSH message is absent in the server.

[0056] Now that the PUSH message type information is "0001", on-acquired data in the server unit is mail data only.

[0057] The PUSH message storage capacity information is accessory information to each PUSH message type. "1" indicates that the PUSH message storage capacity in the server is full.

[0058] Now that the PUSH message type information is "0000", the PUSH message storage capacity in the server is not full.

[0059] In case the data transmitting/receiving means 101 has received information on PUSH messages contained in the PUSH message incoming notice shown in Fig. 5, the information is notified to the PUSH message request processing means 104. The PUSH message request processing means 104 analyzes the description in the PUSH message incoming notice and determines that the server contains non-acquired mails (see step 101).

[0060] The PUSH message request processing means 104 makes an inquiry about whether available area is present in the mail memory or not to the PUSH message managing means 106. The PUSH message managing means 106 checks for available mail memory. In case the mail memory in the PUSH message save means 103 is full of mails which have already been read and are unprotected, the mails can be overwritten and the memory is assumed to be available. In case the mail memory is available, a mail acquisition request is made (see step 103).

[0061] A particular example of the PUSH message (mail) acquisition request message is shown in Fig. 6. The PUSH message acquisition request message is configured in accordance with the HTTP request message. The HTTP request message is composed of a method to indicate the processing request details, URL information to locate the destination and HTTP version information.

[0062] In the PUSH message (mail) acquisition

request message in Fig. 6, the method to indicate the processing request details is "GET", which indicates a contents acquisition request. The URL information contains the destination address, PUSH message type and acquisition request PUSH message ID. The PUSH message type "e_mes" indicates that the PUSH message as an object of acquisition request is a mail. The acquisition request PUSH message ID is represented in five digits following "NXT=". Note that "00000" is an ID indicating start of a PUSH message acquisition request. "HTTP/1.0" indicates that the HTTP version is 1.0.

[0063] Fig. 7 shows a first particular example of the PUSH message acquired from a server conforming to the HTTP response format.

[0064] HTTP response data is composed of a response line, header, and body which corresponds to a text. The first line is a response line and composed of HTTP version information, status code of processing results on the request, and explanation on the status code.

[0065] In the example shown in Fig. 7, the HTTP version is 1.0, as understood from "HTTP/1.0". The status code "200", indicating that the request has been accepted by the server and text data is valid data for the request. "OK" is an explanation of the status code.

[0066] From the second line to the vacant line indicated by (CR)(LF)(0x0D,0x0A) correspond to header. "Content-Length" indicates the number of bytes of the text data.

[0067] "Content-Type" indicates the contents type of the text data. "text/plain" indicates a plain text. Header information starting with "X-" is header information expanded to acquire PUSH messages.

[0068] "X-EID" indicates the mail ID. The first half "00001" indicates the ID of the mail as acquired text data. The second half "00002" indicates the mail ID used to make an E-mail acquisition request next time.

[0069] "X-D" is date information and indicates the time when a PUSH message arrived at the server. "199812171639" indicates December 17, 16:39, 1998.

[0070] "X-F" indicates the source mail address

[0071] Fig. 8 shows a second particular example of the PUSH message acquired from a server. Same as the first specific example, the PUSH message conforms to the HTTP response format. "X-EID" which is header information expanded to acquire PUSH messages indicates a mail ID. The first half "00002" indicates the ID of mail which is acquired text data. The second half indicates the mail ID used to make an E-mail acquisition request next time. In Fig. 8, the second half is "00000", indicating that the server unit does not store any non-acquired mails.

[0072] Fig. 9 is a sequence diagram showing the processing made between a receiving terminal and a server unit during data transmission made by the mobile terminal and the server unit via a network. This example shows a case where two mails destined for a receiver 1 are stored in the server unit.

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[0073] The server assigns the mail IDs of two mails to 00001 and 00002 respectively. The server transmits a PUSH message incoming notice in order to notify the receiver 1 that non-acquired PUSH messages (mails) are stored in the receiver 1. Shown in the figure is a case where the PUSH message incoming notice is transmitted to the receiver 1.

[0074] In the receiver 1, based on the PUSH message incoming notice received via the data transmitting/receiving means 101 shown in Fig. 5, the PUSH message request processing means 104 sees the PUSH message type information mail as "1" and determines that non-acquired mails are stored in the server, then makes an inquiry about present or absence of available memory for acquisition of mails to the PUSH message managing means 106. Here, it is assumed that available memory for acquisition of mails is present in the PUSH message save means 103.

[0075] Because available memory for acquisition of mails can be reserved, the PUSH message request processing means 104 transmits to the server a PUSH message (mail) acquisition start request (see step 103).

[0076] The server unit, on receiving the PUSH message (mail) acquisition start request, transmits the first mail as a PUSH message shown in Fig. 7 to the receiver 1.

[0077] "X-EID:00001/00002" indicates that the first mail transmitted from the server unit to the receiver 1 corresponds to the mail having the mail ID "00001" stored in the server.

[0078] The second half "00002" is instruction information which indicates that non-transmitted mails are stored in the server unit, and instructs that the ID "00002" be used for a PUSH message (mail) acquisition request made by the receiver 1.

[0079] The receiving terminal, on receiving a PUSH message (mail) acquisition response, saves the received mails in the mail memory reserved in the PUSH message save means 103 (see step 105).

[0080] The receiver 1, on receiving the data transmitted from the server unit, transmits a data receiving completion response to the server unit via the data transmitting/receiving means 101.

[0081] The server, on receiving the data receiving completion response from the receiver 1, assumes that mail transmission to the receiver 1 is complete and deletes the mail having the mail ID "00001" in the mail box.

[0082] The receiver 1, checking that the mail ID to be requested next contained in the PUSH message (mail) acquisition response is other than "00000", determines that non-acquired mails are stored in the server unit (see step 106). To acquire mails again, a check is made to determine whether mail memory is available or not. In this case also, it is assumed that available memory is present in the PUSH message save means 103.

[0083] The receiver 1 transmits the PUSH message (mail) acquisition request "NXT=00002" to the server

unit. The server unit, receiving the PUSH message (mail) acquisition request, transmits the mail having the mail ID: 00002 stored in the mail box to the receiver 1 as a PUSH message shown in Fig. 8.

[0084] In doing so, the mail box on the server does not store any non-transmitted mails. Thus transmission is made assuming the mail ID information as "X-EID: 00002/00000".

[0085] "00002" is the mail ID of the mail text being transmitted and the second half "00000" indicates that the server unit does not store any non-transmitted mails.

[0086] The receiver 1, on receiving the data transmitted from the server unit, transmits a data receiving completion response to the server via the data transmitting/receiving means 101.

[0087] The server, on receiving the data receiving completion request from the receiver 1, assumes that mail transmission to the receiver 1 is complete and deletes the mail having the mail ID "00002" in the mail box.

[0088] While in the embodiment, in determining whether the PUSH message memory is available or not by the PUSH message managing means 106, PUSH messages which have already been read and are unprotected can be overwritten and the memory is assumed to be available, overwriting can be disabled unless PUSH messages are deleted via user operation.

30 Industrial Applicability

[0089] Thus, according to the invention, it is possible to provide a mobile terminal such as a portable telephone set equipped with relatively small data memory and a data transmission scheme adapted to receive PUSH messages provided by the information source at an arbitrary timing without fail.

Claims

1. A mobile terminal which receives an incoming notice, characterized in that said mobile terminal, triggered by signals contained in said incoming notice showing the presence of a delivery message destined for said mobile terminal in a server unit, makes a request for acquiring said delivery message, and receives said delivery message transmitted from said server unit based on said delivery message acquisition request.
2. A mobile terminal according to claim 1, characterized in that said incoming notice contains a delivery message type showing a major classification of said delivery message, and that said mobile terminal makes a delivery message acquisition request to said server unit based on said delivery message type.

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3. A mobile terminal according to claim 1, characterized in that said mobile terminal checks whether said mobile terminal can reserve a delivery message save area or not before making said delivery message acquisition request based on said incoming notice, and that, in case the delivery message save area can be reserved, said mobile terminal makes said delivery message acquisition request. 5
4. A mobile terminal according to claim 3, characterized in that said mobile terminal determines that, in case delivery messages saved in said mobile terminal have been read and are not protected, they can be overwritten by a new incoming delivery message and determines that the save area can be reserved in a decision whether the delivery message save area can be reserved or not. 10 15
5. A mobile terminal according to claim 2, characterized in that said delivery message type may be a mail. 20
6. A data transmission scheme whereby a mobile terminal and a server unit performs data transmission via a network, characterized in that, when said mobile terminal returns a response indicating that said mobile terminal has received delivery messages transmitted from said server unit, said server unit deletes the stored messages. 25

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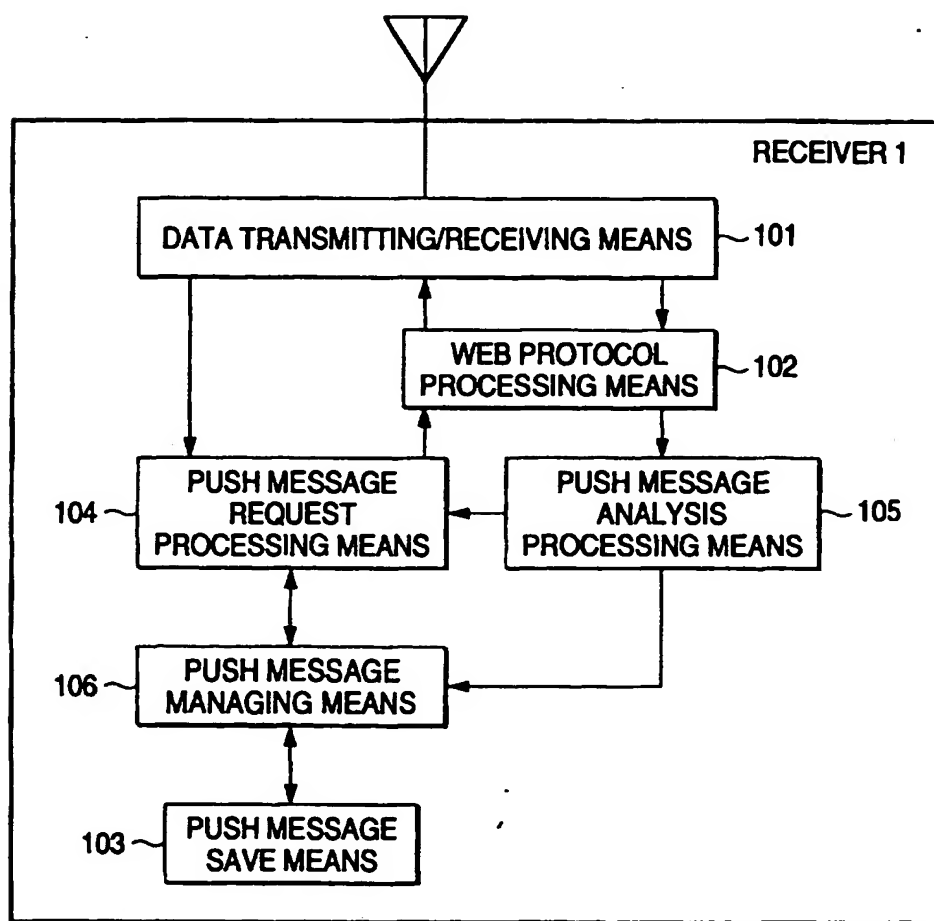
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FIG. 1



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FIG. 2

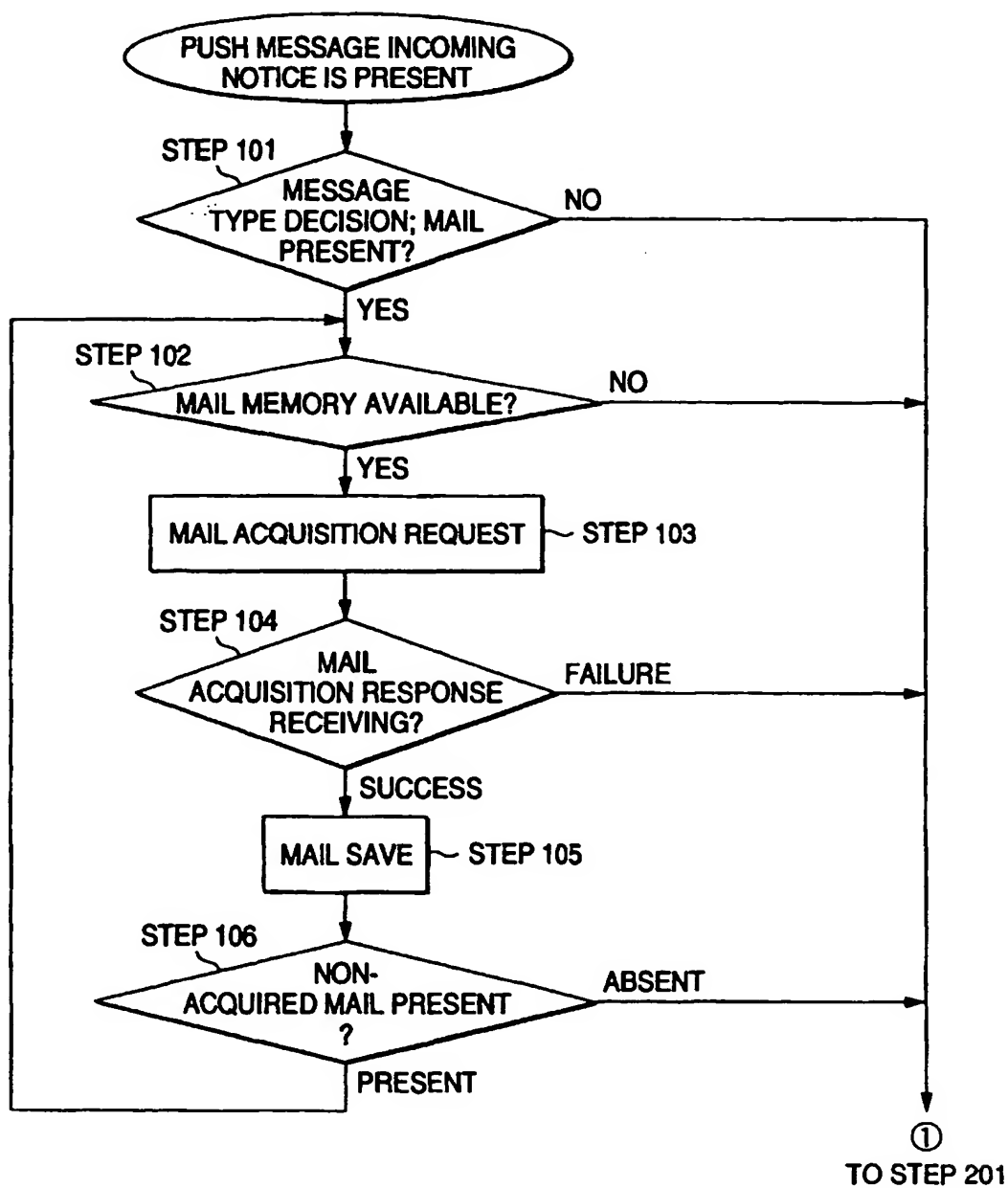
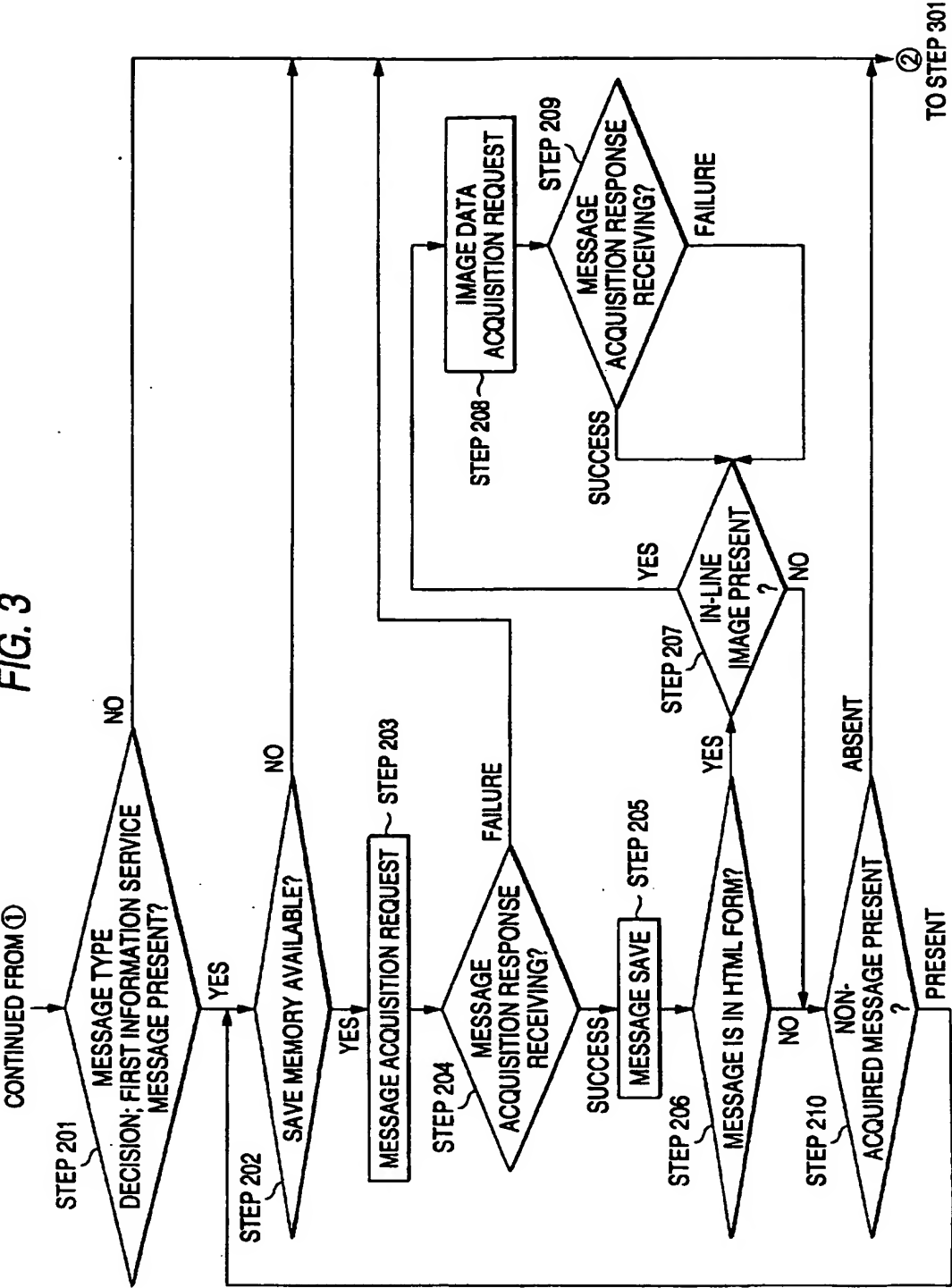
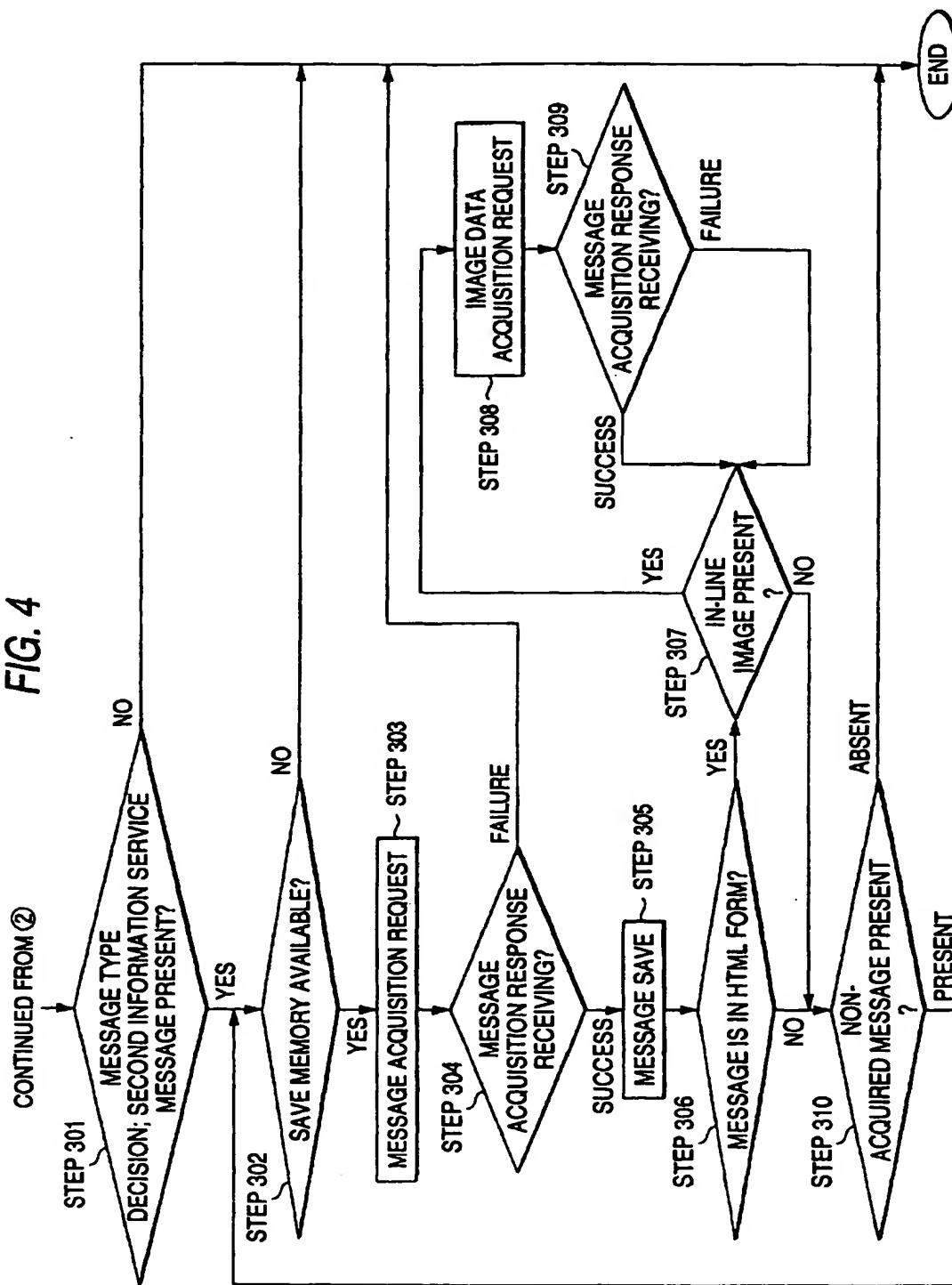


FIG. 3



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FIG. 4



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FIG. 5

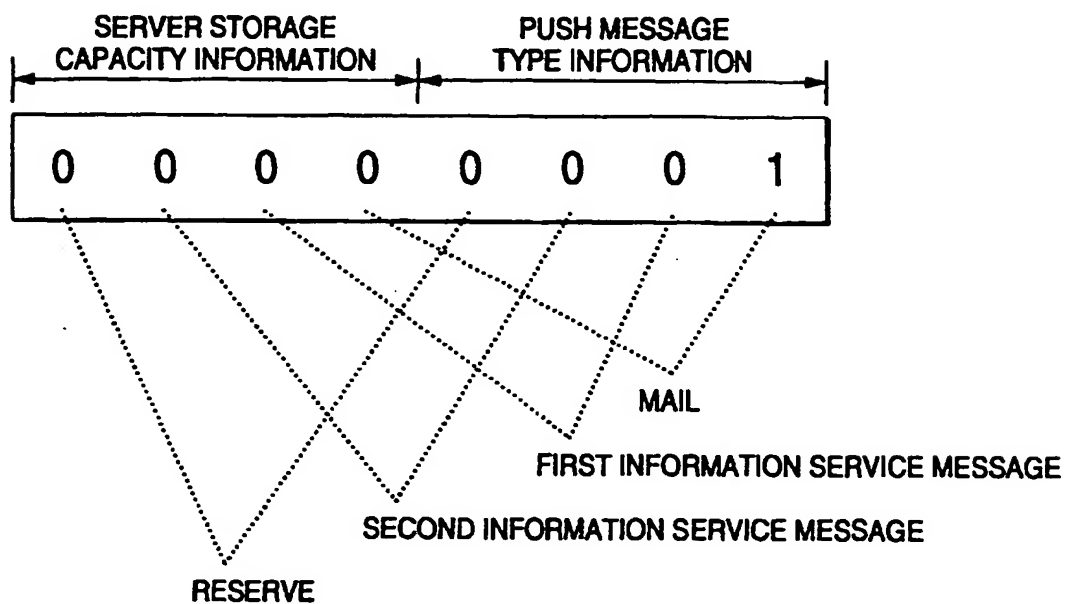


FIG. 6

GET http://docomo.ne.jp/ml/e_mes?NXT=00000 HTTP/1.0

① ② ③ ④ ⑤

① METHOD
② ADDRESS
③ PUSH MESSAGE TYPE
④ ACQUISITION REQUEST PUSH MESSAGE ID
⑤ HTTP VERSION INFORMATION

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FIG. 7

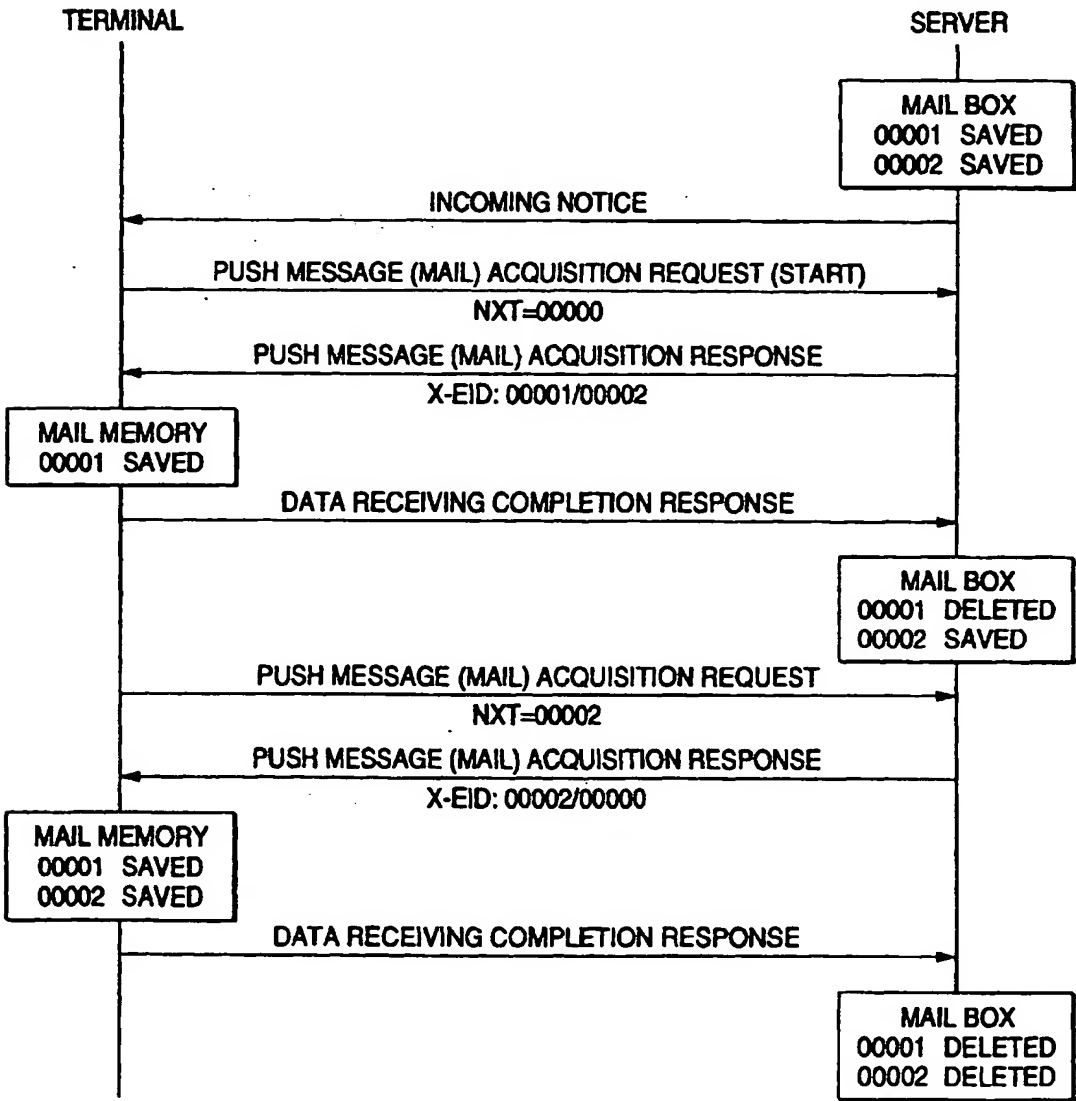
HTTP/1.0 200 OK
Content-Type: text/plain
Content-Length: < TEXT SIZE >
X-EID: 00001/00002
X-D: 199812171639
X-F: SOURCE MAIL ADDRESS
<CR> <LF>
TEXT

FIG. 8

HTTP/1.0 200 OK
Content-Type: text/plain
Content-Length: < TEXT SIZE >
X-EID: 00002/00000
X-D: 199812171639
X-F: SOURCE MAIL ADDRESS
<CR> <LF>
TEXT

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FIG. 9



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP00/00206

A. CLASSIFICATION OF SUBJECT MATTER Int.Cl. ⁷ H04L 12/58 G06F 13/00, 351 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) Int.Cl. ⁷ H04L 12/58 G06F 13/00, 351 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho(Y1,Y2) 1926-1996 Toroku Jitsuyo Shinan Koho(U) 1994-2000 Kokai Jitsuyo Shinan Koho(U) 1971-2000 Jitsuyo Shinan Toroku Koho(Y2)1996-2000 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Nikkei Communication, No.265, (Japan), Nikkei BP K.K., (02.03.98) Pages 136-144, Fig.1②	1
Y	Pages 136-144, Fig.1②	2-5
A	Pages 136-144, Fig.1②	6
X	JP, 10-190879, A (Casio Computer Co. Ltd.), 21 July, 1998 (21.07.98), Par. Nos. 0006, 0073 to 0076; Fig. 8 (Family: none)	6
Y	JP, 10-161949, A (Casio Computer Co. Ltd.), 19 June, 1998 (19.06.98), Par. Nos. 0021 to 0037; Fig. 3 (Family: none)	2,5
Y	JP, 7-79248, A (FDK CORPORATION), 20 March, 1995 (20.03.95), Par. Nos. 0012, 0033 to 0036; Fig. 2 (Family: none)	3-4
A	JP, 10-13545, A (Matsushita Electric Ind. Co., Ltd.), 16 January, 1998 (16.01.98), Par. Nos. 0029 to 0035; Fig. 5 (Family: none)	1-6
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "A" document member of the same patent family		
Date of the actual completion of the international search 06 April, 2000 (06.04.00)		Date of mailing of the international search report 18 April, 2000 (18.04.00)
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer
Facsimile No.		Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP00/00206

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP, 10-290255, A (Sony Corporation), 27 October, 1998 (27.10.98), Par. Nos. 0031 to 0045; Figs. 6 to 7 (Family: none)	1-6
P,X	NTT DoCoMo Technical Journal, Vol.7, No.2, (Japan), Shadanhoin Denki Tsushin Kyokai, (01.07.99), Pages 22-27	1-3,5,6

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